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MARKETING COTTON AND COTTON TEXTILES

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October 1966

MARKETING COTTON AND COTTON TEXTILES

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Agricultural Economist

INTRODUCTION

Cotton has been, and remains, a very significant part of the U.S. economy, but market supply, disappearance, and prices have fluctuated widely during the past several decades. The leadership of cotton as a raw material for the U.S. textile industry is being challenged by manmade fibers, and cotton industry leaders are increasingly concerned about this competition. In addition, the industry is faced with rising costs, competition from foreign cottons for export outlets, the problem of maintaining and improving quality, the need to find and promote new uses and markets for cotton, and competition from manmade fibers, plastics, paper, and other raw materials.

For centuries, cotton has been an important article of human consumption and world trade. It is one of the world's major raw materials, and almost all industrial nations engage in manufacturing it. One of the first steam-driven machines was made for spinning cotton; the cotton gin was one of the first major inventions in the United States. The adaptation of cotton processing to the factory system ushered in the industrial revolution, and England's commercial supremacy for several decades was due largely to her trade in cotton and cotton textiles. Today, in the midsixties, investments in real estate; in processing, marketing, and transportation facilities; in textile and apparel manufacturing plants; and in wholesaling and retailing establishments total billions of dollars (65). 1/

Annual cash receipts from farm marketings of cotton lint and cottonseed approximated $2.5 billion annually during the early sixties. This amounts to roughly 8 percent of the total cash receipts for all U.S. farmers. Cotton lint accounts for about 85 to 90 percent of the farm income received from cotton; and cottonseed and other byproducts, for 10 to 15 percent. 2/ Value added by textile mill processing and the manufacturing of cotton apparel and other items is estimated at $7.0 to $7.5 billion annually. The wholesaling and retailing of these items contributes additional billions of dollars to gross national product.

About 14 to 15 million bales of cotton are marketed annually from approximately a half-million farms located in all southern States from Virginia to California. 3/ Over half of the crop is grown in the Southwest and the West, and only about 15 percent in the Southeastern States, where the textile mill industry is concentrated. Thus, the cotton marketing system is responsible for transporting a large proportion of the crop several hundred miles to domestic mills or to port warehouses for export. U.S. cotton is harvested in late summer and early fall, but is processed by domestic and foreign mills on a year-round basis. Hence, storage is another major function of the cotton marketing system.

1/ Underscored numbers in parentheses refer to the Selected References, p. 144.

2/ The marketing of cottonseed is discussed in Chapter 7.

3/ Major cotton-growing States are commonly divided into the following four areas: West--Arizona, California, and New Mexico; Southwest--Oklahoma and Texas; Midsouth--Arkansas, Louisiana, Mississippi, Missouri, and Tennessee; Southeast--Alabama, Georgia, North Carolina, South Carolina, and Virginia.

The yarns, woven goods, and other products of domestic mills are shipped to manufacturers of cotton apparel and household articles located principally in the industrial Northeastern and Mid-Atlantic States, or to foreign manufacturers. Finally, finished cotton items are packaged, stored, and shipped through wholesalers to retail outlets in every city and town in the United States, or through exporters to foreign retail outlets.

Changes in technology are constantly being made at all stages of the marketing systems for cotton and cotton textile products. Associated with these developments are changes in market structure and organization, and in efficiencies of providing marketing services. In addition, the ever-changing character of consumer demand for textile products greatly influences the cotton and cotton-products industries.

An evaluation of these changes should help in understanding problems confronting the U.S. cotton industry, and in appraising prospective developments in marketing which may strengthen the competitive position of U.S. cotton.

MARKETING COTTON LINT

Except for farm producers, firms directly involved in handling, processing, and transporting raw cotton from farm to textile mills do not usually own or buy and sell cotton; they render services--as directed by buyers and sellers--which facilitate ownership transactions. Thus, a discussion of the marketing of raw cotton involves its physical movement, changes in owernship, and the services performed by marketing agencies.

Physical Flow and Processing

Transportation of Seed Cotton.--As seed cotton is harvested, it is hauled from the field to nearby cotton gins in trailers pulled by farm-type tractors or pickup trucks. In almost all areas of the Cotton Belt, this initial step in the physical flow of cotton is performed by the producer (fig. 1). In some areas, producers provide their own trailers; in others, the ginning firms provide seed cotton trailers as a competitive means of obtaining additional ginning volume. In major producing areas, trailers used today hold enough seed cotton to yield from 4 to 8 bales of ginned lint.

Ginning.--At the gin, the seed cotton is conditioned and cleaned; then the lint is separated from the seed and packaged into bales weighing roughly 500 pounds. This is the first major process in the cotton marketing system. Some gin owners may also grow cotton, merchandise cotton, operate cottonseed oil mills, or have other related business interests. Both vertical and horizontal integration at various stages of the marketing system are becoming increasingly evident.

Fifty years ago, there were some 25,000 gins in the United States; in 1962, there were only about 5,000 gins processing approximately the same total volume. The steady decline in number of gins, and the increase in volume handled per gin have been accompanied by a sharp rise in the cost of constructing a modern gin plant. Large modern plants erected in the early sixties required investments of $250,000 to $350,000, whereas in the early fifties an up-to-date gin cost $50,000 to $75,000 (9, 17, 26, 37). By the midsixties, capital outlays for new high-capacity gins were approaching a half-million dollars. The cost of gins has increased because of the increase in mechanized harvesting, and because of the rise in the general price level.

Seed cotton which has been machine harvested is delivered to gins in a rough and trashy condition. Additional seed cotton cleaning and conditioning equipment,

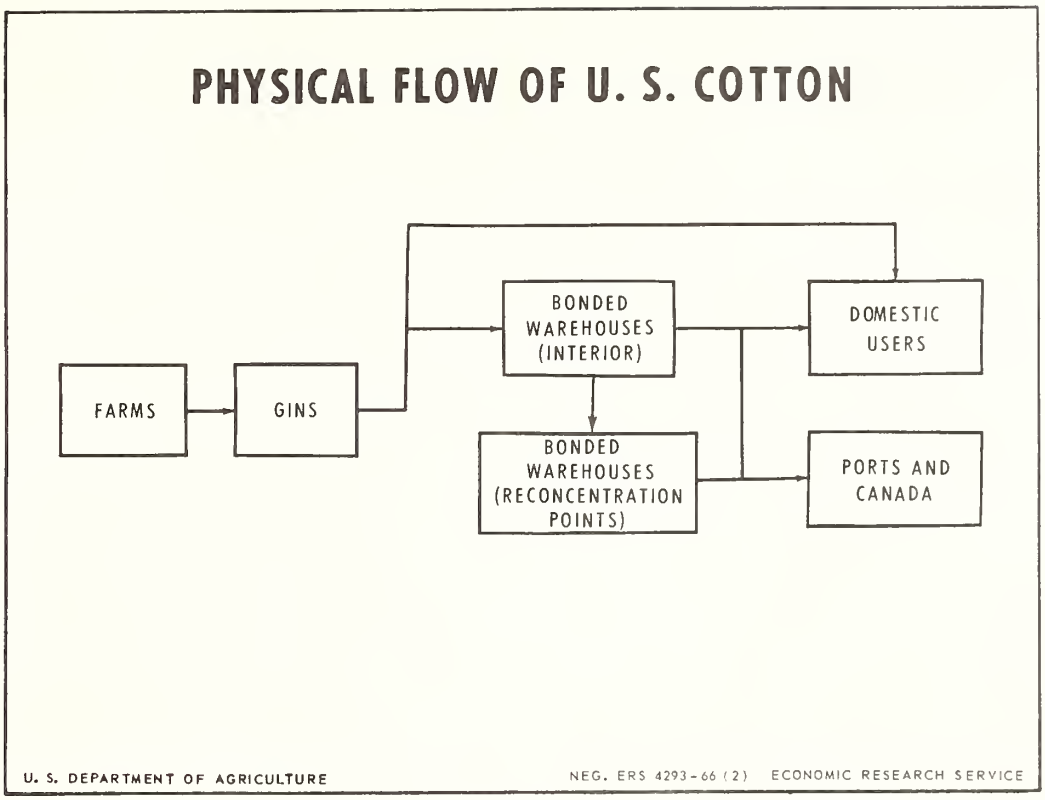


Figure 1

and lint-cleaning machinery have been added in almost all gins in recent years to facilitate ginning the roughly harvested crop. Machine harvesting also has greatly accelerated the rate of cotton harvest and delivery to gins. To keep pace with the rate of harvest, many ginners have increased their rate of ginning either by adding gin stands and other equipment, or by installing new higher capacity machinery.

To meet rising fixed cost, and corresponding increases in operating costs, charges for the ginning service have almost quadrupled during the past 33 years, closely following the year-to-year increases in ginning costs. In 1932-33, the average charge in the United States for ginning was $4.34 per bale; by 1964-65 this charge was $16.78 per bale (22, 27). This increased cost of ginning to producers is equivalent to a reduction of almost 2.5 cents per pound in prices they receive for cotton.

Increasing ginning volume and improving the efficiency of plant operation are two possibilities for reducing unit costs of ginning. Greater volumes could reduce the cost per bale for depreciation, taxes, and similar items of fixed cost. More efficient operation would lower such variable costs as power and labor. Substantial savings in power cost may be realized by more efficient use of air systems for materials handling; by rearranging gin machinery to eliminate unnecessary fans, motors, and piping; and by properly loading electric motors (31, 64, 67, 68). More efficient use of labor could reduce total ginning costs by 2 to 5 percent in a majority of plants (6).

Possibilities for substantially reducing fixed cost per bale appear limited in view of the trend to more elaborately equipped gins and the common practice of ginning the crop simultaneously with harvesting. A few gins have constructed storage

facilities to receive seed cotton as it is harvested, and to increase their total ginning volume. However, the cost of storing seed cotton may, in some cases, more than offset the reduction in fixed cost of ginning resulting from larger seasonal volume (43, 52).

Warehousing and Compressing.--Storing and compressing baled lint are necessary functions for the efficient marketing and handling of U.S. cotton. In the Southeastern States, a substantial amount of cotton moves direct from gin to local mills; in other areas of the Cotton Belt, the crop moves from gins through warehouses with compresses. As packaged at almost all gins, the bales are pressed to a density of about 12 pounds per cubic foot (1). Compression reduces the volume and increases the density of bales, and decreases the space required for storage and transportation. For domestic shipment, bales are compressed to standard density of about 23 pounds per cubic foot; for export shipments they are compressed to high density, about 33 pounds per cubic foot. A very low percentage of the total crop is pressed to standard density at the gin, thus eliminating the extra handling and compression at warehouses for such bales sold to domestic mills. Most of the gins equipped with standard density presses are located in the West.

In addition to compressing and storing baled lint, the cotton warehouse industry performs other services necessary to merchandise the crop. Some of these services are weighing; reconditioning bales; issuing negotiable warehouse receipts; sampling, sorting, and assembling cotton in even-running lots for shipment at the direction of merchants; and loading rail cars and other carriers.

In the midsixties there were about 1,200 cotton warehouses in the United States with a total storage capacity of about 27 million bales. About 64 percent of the warehouses were located in the Southeast, 16 percent in the Midsouth, 18 percent in the Southwest, and 2 percent in the West. In terms of storage capacity, approximate percentages of the total located in each of these respective producing areas were 25, 34, 33, and 8.

Half of the total storage capacity is accounted for by about 205, or 17 percent, of the warehouse establishments. This capacity, located throughout the Cotton Belt, is under the control of only 14 separate business organizations. Over a third of the total capacity, which is controlled by the five largest business firms, is concentrated in 155 warehouses, 13 percent of the total number.

Only about one-fourth of the warehouses have compress facilities, but these have some two-thirds of the total U.S. storage capacity for cotton. Less than 1 percent of the warehouses in the Southeast have compresses, whereas approximately 60, 55, and 85 percent of those in the Midsouth, Southwest, and West, respectively, have compresses.

Since the late thirties, the number of warehouses with compresses declined about 15 percent. However, in the West, the number almost tripled. The number of warehouses without compresses also declined some 15 percent during the past 25 years. Much of this decline occurred in the Southwest and the Midsouth. Formerly these small warehouses were available to farmers and local buyers for storing bales during and immediately after harvest. After the cotton was purchased by a central market firm, it was moved from the country point to a larger facility located at a transportation center. However, with the improvement in roads and the adoption of flat-bed semitrailer trucks, an increasing proportion of the Nation's crop moves directly from gins to centrally located storage facilities.

Charges for warehousing and related services in the United States have trended upward since the early forties, following a period of fairly stable charges during the thirties. Charges for receiving (which generally includes unloading of bales arriving for storage, tagging, weighing, sampling, issuing a warehouse receipt, and movement of bales to a temporary block preparatory to storing) increased from averages of 27 cents a bale in 1942-43 to 74 cents in 1964-65.

Storage charges per month increased from 20 cents to 52 cents a bale during the same period. Charges for compressing also increased--from $0.65 to $1.56 for compressing to standard density and from $0.78 to $1.89 for compressing to high density.

Transportation.--The transportation of baled lint from the gin to the warehouse is generally arranged for by the ginner. The cost of this service is usually included in the ginning charges.

Reconcentrating cotton in warehouses at strategic transportation centers and moving it from these points to domestic mills or dockside accounts for the greatest proportion of the total transportation cost for cotton. During the early sixties, the Southeast mill area was the destination of about 8 million bales of cotton, and over 4 million bales were transported to ports. Shipments to Alabama and Georgia represented about equal proportions from the Southwest, Midsouth, and Southeast, but only 5 percent from the West. The Midsouth was a much heavier shipper to the Carolinas and Virginia and also to the Northeast and Canada than other regions. The Southwestern region was the lightest shipping region to the Carolinas and Virginia (50). About 90 percent of shipments to the port destinations originated in the Southwest and the West. U.S. cotton exports go primarily from ports in Louisiana, Texas, and California.

Except in the Southeast, the volume of cotton hauled by rail greatly exceeds the volume transported by trucks. Approximately 78 to 80 percent of the cotton originating in the other three areas was moved by rail in 1961-62 (49).

Rail transportation is the major component of the cost of moving cotton from warehouses to domestic mills. From the early thirties to the end of World War II, rail freight rates for cotton increased only slightly, then increased sharply to a peak in the midfifties. From this peak they gradually declined, and by the midsixties they had dropped to the lowest level since the early fifties.

Marketing Agencies and Practices

The marketing system for buying and assembling cotton in production areas and sorting, selling, and shipping it to domestic and foreign mills is a highly organized, complicated system. Merchandising firms handling spot cotton perform their functions and services at all levels of the marketing system from farm to mill.

The long chain of ownership transfers begins when the producer sells his cotton to a firm at the local market level or pledges it as collateral for a loan from the Commodity Credit Corporation (fig. 2). 4/ In some parts of the Cotton Belt, ginners

4/ Pledging cotton as collateral on a Government loan is not, in a strict sense, transferring ownership. However, the producer has the option of repaying his loan and selling the cotton prior to the end of the marketing year, July 31, or leaving it in the loan and letting the Government take title to it on August 1.

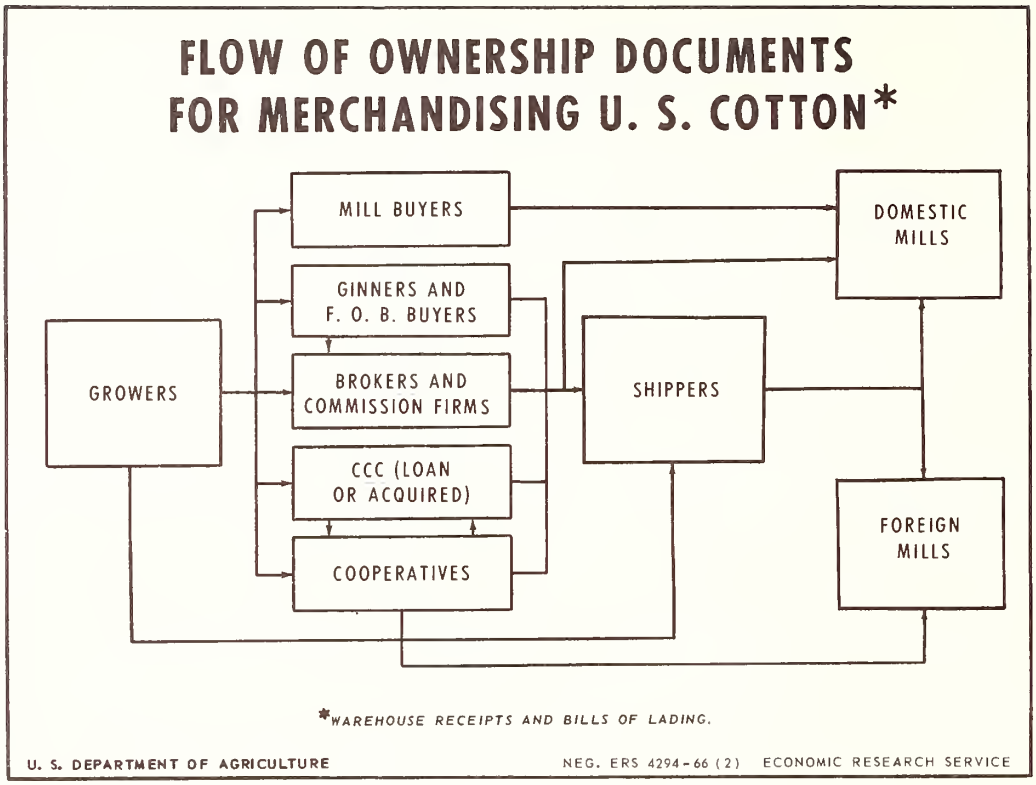


Figure 2

and local merchants are important outlets for producers. In addition, several of the large textile mills have salaried or commission buyers at the local market level. Some growers employ a broker to sell their cotton. Farmer cooperatives are increasing in importance in some areas, marketing producers' cotton direct to domestic and foreign mills, or putting cotton into the Government loan for their members.

Approximately half of the 1962, 1963, and 1964 crops went into the Government loan soon after ginning. Loans on only from about a fifth to a third of this volume were repaid during the marketing years for these crops. Hence, the U.S. Government has actually become the largest single outlet for cotton during the last few years, reducing the quantity purchased by gins and other private local market firms. For example, ginners purchased a third of the 1947-48 crop, slightly more than a fourth of the 1954-55 crop, about a fifth of the 1962-63 crop, and about a sixth or less of the 1963-64 and 1964-65 crops (25). In addition to activities of the Government loan program and cooperatives, the increase in direct mill buying has also contributed to the decline in such local market firms as buyers and brokers.

Almost all sales by producers, and Government loan rates, are based on the grade and staple length of each bale. The U.S. Department of Agriculture provides a quality classification service--at no charge to growers who qualify for the service as members of cotton improvement associations--through its Cotton Classing Offices throughout the Belt. Cotton is classed--that is, its grade and staple length determined--on the basis of a sample taken from each bale, usually at the warehouse or gin. This service helps the producer determine the value of his cotton before offering it for sale to local marketing agencies. Beginning with the 1966 crop, the mike reading,

along with grade and staple, will be provided by Cotton Classing Offices. The mike reading, a measure of fiber fineness and maturity in combination is an important quality attribute from the standpoint of spinning performance and end-use value; it is rapidly becoming an important element in pricing cotton (15).

Depending on functions performed and methods of operation, central market firms may be classified as shippers, local merchants, mill buyers, commission buyers, and brokers. Most of these firms, regardless of type, have some common characteristics. Normally, they handle no other commodity, and few are allied with any other business, although several produce, gin, and store cotton and process cottonseed.

For many decades, central market cotton firms were specialists, concentrating primarily on one method of operation. However, in the early fifties, as a matter of survival, many of them adjusted to the changing marketing conditions by diversifying their operations. As a result, by the early sixties over a fifth of the active central market firms were multitype businesses. If present competition and lines of cotton movement continue, the trend to multitype operations is likely to continue.

Central market firms operating as shippers are the major link between the farm producer and the mill consumer of raw cotton. Through their competitive trading and selling to mills, price differentials for different classes (grade and staple length combinations) of cotton are established on the basis of mill demands and market supplies. Shippers buy baled cotton in lots of mixed qualities as near the points of growth and as soon after it enters marketing channels as practicable. Bales are then concentrated and stored at locations that provide economical distribution. After determining quality and sorting the bales into lots of "even-running quality," they are ready for sale under terms suitable to the needs of the textile mills. In selling, shippers generally arrange for, and pay the costs of, transportation. Most of the costs and risks associated with other marketing services--including assembly, sampling, quality classification, storage, price risks, and selling--are also assumed by shippers.

Central market firms regulate their own operations and practices through several regional associations and the American Cotton Shippers Association, and through cotton exchanges in the major central markets. Through its governing body, the national association establishes equitable and standardized merchandising practices for its members. It also negotiates with manufacturers of raw cotton to regulate trading rules and settle disputes that may arise between a central market firm and a mill.

Brokers, local merchants, and commission buyers function chiefly in aiding cotton shippers in acquiring or selling cotton. Brokers are agents who sell on commission for various types of owners. Changes in the movement of cotton in recent years have greatly reduced the number of brokers and the need for their services. Considerable quantities of cotton, which once would have been handled by brokers for producers and local market buyers, now move directly into the Government loan or are purchased directly by mill buyers.

Commission buyers purchase cotton primarily for shippers and mills; most of their purchases are made at country points from growers, ginners, and local buyers. The need for services provided by these firms has also declined during the past decade, and consequently the number of such firms has dropped considerably.

Local merchants, who buy cotton in local markets or at gin points, resell in mixed lots within a short time to shippers or mill buying agencies in nearby central markets. Like shippers, they take title to the cotton, but they assume fewer risks and perform fewer services. Again, there is less need for such firms in recent years because of the more direct movement of cotton from producers into Government loan stocks or to domestic mills, and their number has declined.

Several of the larger textile mill firms maintain buying offices in central markets rather than using the services provided by other types of central market firms. Direct mill buying, which is becoming more prevalent in marketing raw cotton, is a clear-cut example of vertical integration in the cotton industry.

Cooperative marketing associations in many areas of the Cotton Belt act as shippers for their members. In the past decade, the volume handled by these organizations has increased rapidly and no doubt has contributed to the decline in the number of brokers, local merchants, and other types of central market firms. This expansion in the cooperative marketing of cotton by producers is another example of economic integration in the cotton industry.

Fifteen of the central markets are "designated spot cotton markets." A quotations committee in each of these markets issues cotton price quotations as required by U.S. cotton futures legislation. The markets are designated by the Secretary of Agriculture, and the committees are supervised by the Department of Agriculture. The designated markets were evaluated in 1951-52 and again in 1959-60 for their suitability as major sources of price information (45, 57). Appraisal criteria were number of firms, volume of trading, distribution of trading during the season, origin of cotton, quantity of cotton produced within a 100-mile radius of the market, and qualities of cotton handled. On the basis of these criteria, Memphis ranked first, Dallas second, and Charleston 14th, during both appraisal periods. Phoenix became the 15th designated market in 1962.

The rankings of several markets shifted, and the total number of active firms declined from 523 to 410 between 1951-52 and 1959-60. These changes are indicative of others which have occurred in the marketing system at the central market level. In this 8-year span, the number of firms decreased in 12 markets, remained unchanged in 1, and increased substantially in Lubbock.

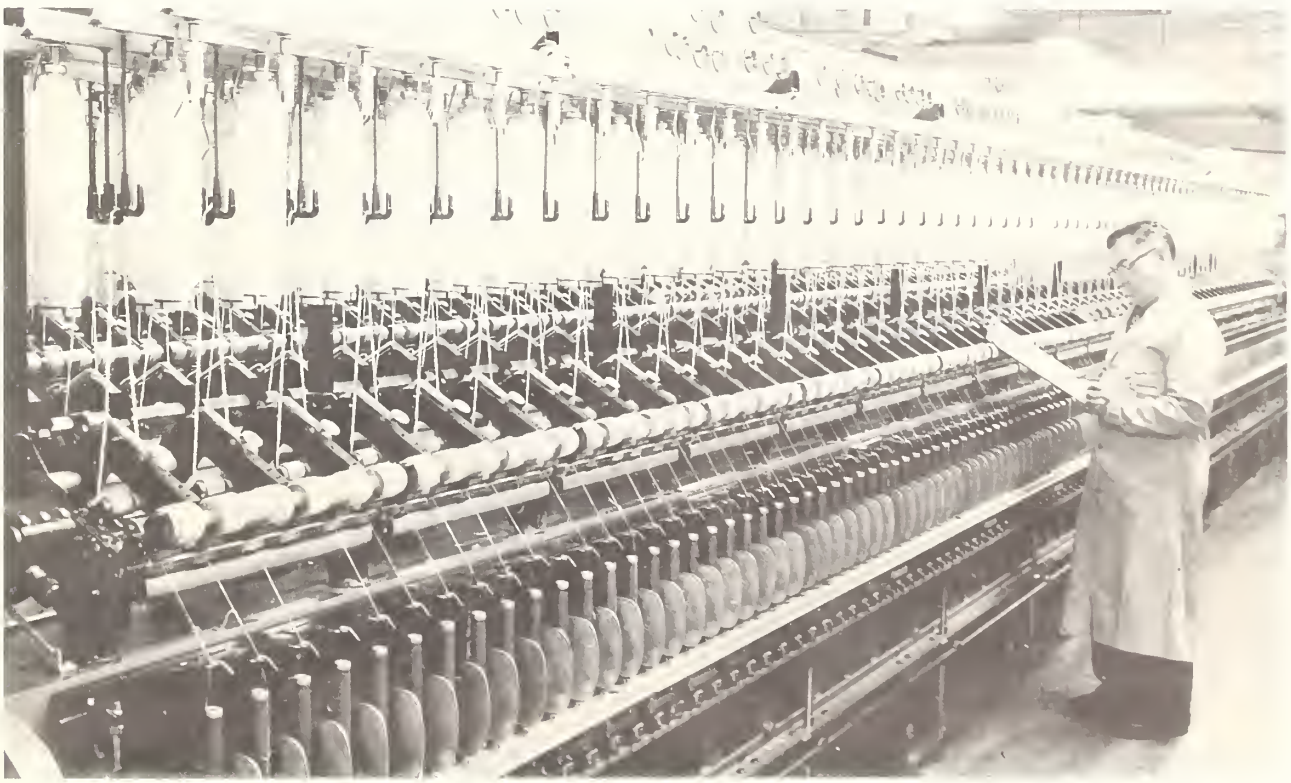
Since 1959-60, there has been a further decline in the number of firms in all markets. With the growing volumes of a few large farmer cooperative marketing associations, the increase in direct mill buying, and the loan program of the Government, the number of bona fide shippers and other firms in central markets will probably continue to decline. If this does occur, the inclusion of certain markets as designated markets for establishing official price differentials should be reevaluated. As late as 1959-60, firms in the Memphis market handled 435 times as much cotton as was handled in Charleston. However, these 2 markets have equal weight in the calculations of the 15-market average price released periodically by the U.S. Department of Agriculture.

The survival of many firms in central markets also depends on cost trends. Unit costs of most items utilized by central market firms have generally increased. In the midfifties, freight accounted for about one-third of the total costs of U.S. cotton shippers (19). Costs of compressing, concentrating, and handling accounted for about one-fifth, and salaries for another one-sixth of the total. Total merchandising costs for U.S. shippers averaged $12.70 per bale in 1955-56--about 2.5 cents per pound. By the midsixties, total costs had risen to an average of about $13.56 per bale.

Distance from market and transportation rates are important to cotton shippers. In the midfifties, freight costs per bale for moving cotton to Group B mills from Bakersfield, Calif., and from Greenwood, Miss., averaged $9.15 and $4.25, respectively; about 10 years later, comparable freight costs averaged $9.08 and $4.07 per bale. 5/ Total costs in the midfifties averaged $15.40 per bale from Bakersfield, and $9.00

5/ Group B mills are located in the western counties of North and South Carolina.

Stored cotton awaits shipment to mills.



Spinning yarn is one of the many processes involved in converting raw cotton to consumer products.

from Greenwood. By the midsixties, these costs had increased to about $18.81 and $11.39, respectively. A large part of this difference is attributable to differences in distance and rail freight rates.

Transportation accounts for about half of the cost incurred by shippers in marketing cotton to overseas outlets. In some instances, transportation costs for exports may exceed the total cost of marketing to domestic mills.

For a cotton shipper to service his mill customers effectively, he must abide by highly standardized mill rules. In the mill area in the Southeast, these rules are known as "Southern Mill Rules for Buying and Selling American Cotton." The rules cover the nature and form of contract to be used; shipping terms; the use of standards and other methods for classification of cotton; and determination of weight, excess tare, damage to cotton, density of bales, and similar items. In addition, they specify when contracts become binding, when cotton may be rejected and when it must be made good, how and when prices are to be fixed, and means of settling disputes.

To better provide the service required by mill customers, many shippers have an office or broker representative in several strategically located cities and towns in the mill area. To expedite the purchasing of cotton, many mills have salaried buyers or agents who can readily contact local and central market firms or their agents by telephone or telegraph. Because mills are located in many small communities, mill markets may be described as unassembled markets. This is in contrast with the more highly organized exchanges at the central market level. However, from the time cotton manufacturing was mechanized and operated in large factory units, shippers and other central market firms have customarily catered to the wishes of mills in selling cottons to them. Thus for many decades, mills and their representatives have usually been the strongest element in the market. This market strength of mills is of increasing importance to the U.S. cotton industry, because competition and technology have made man-made fibers and foreign cottons substitutable for American cotton.

MANUFACTURING AND DISTRIBUTING COTTON TEXTILE AND APPAREL PRODUCTS

Converting raw cotton into the form demanded by ultimate consumers requires numerous manufacturing processes and changes in ownership. These include making yarn and cloth, finishing cloth, and making consumer items from finished cloth. Firms performing these processes are generally referred to in the trade as textile mills, finishing plants, and cutters, respectively. Ownership of textile products generally moves in the following order: Mills, converters, cutters, wholesalers, retailers, and consumers (fig. 3).

Textile Mills

The primary functions of textile mills are to spin yarns and to weave and knit cloth. Some mills only produce yarns; others specialize in weaving and knitting cloth and fabrics. However, there is a trend toward greater integration and diversification of functions performed by textile mills.

The initial steps of cotton textile manufacturing are opening bales and cleaning the lint, then carding (also combing for fine yarns) and spinning the lint into yarn (16). On an average, about 15 percent of a 500-pound bale is waste and tare (bagging and ties), and 85 percent is made into yarn (fig. 4).

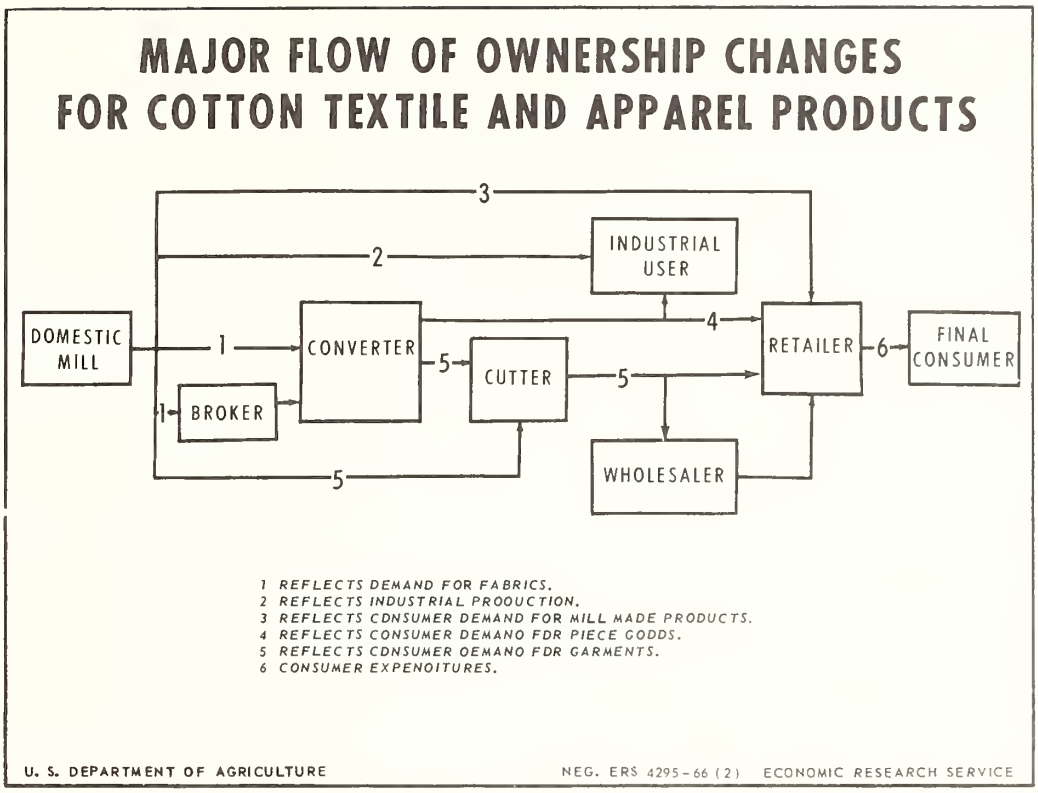


Figure 3

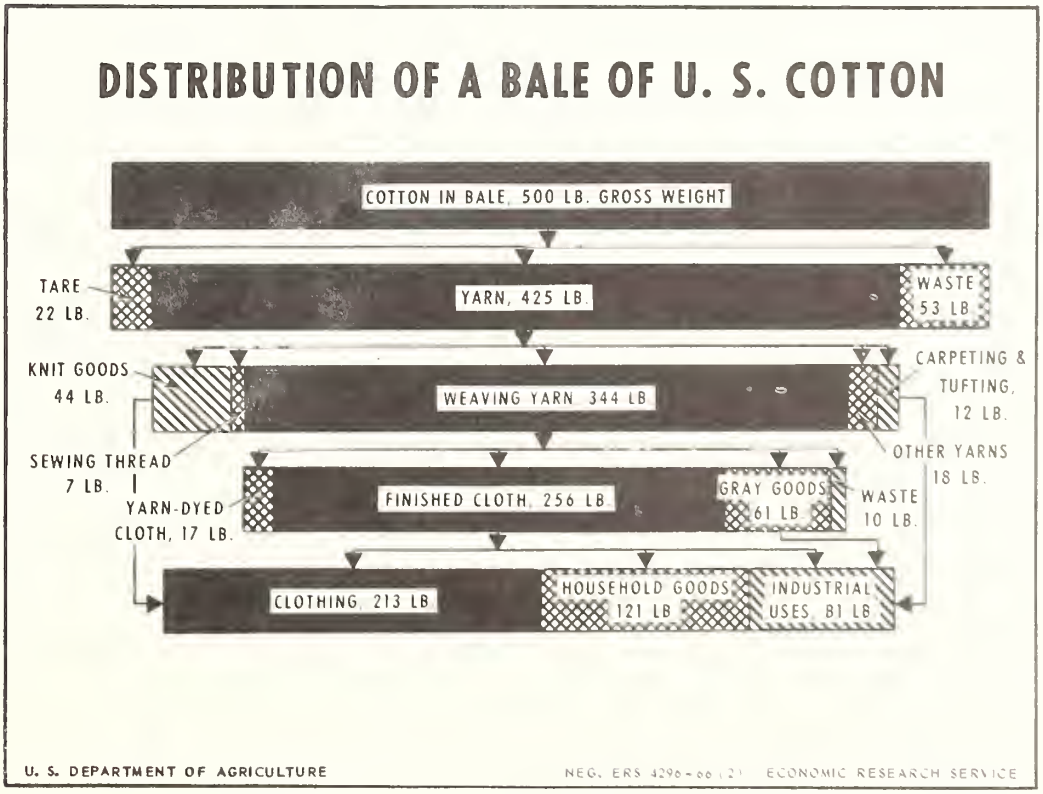

DISTRIBUTION OF A BALE OF U. S. COTTON
COTTON IN BALE, 500 LB. GROSS WEIGHT
TARE 22 LB.
YARN, 425 LB.
WASTE 53 LB.
KNIT GOODS 44 LB.
WEAVING YARN 344 LB.
CARPETING & TUFTING, 12 LB.
SEWING THREAD 7 LB.
YARN-DYED CLOTH, 17 LB.
FINISHED CLOTH, 256 LB.
GRAY GOODS 61 LB.
WASTE 10 LB.
OTHER YARNS 18 LB.
CLOTHING, 213 LB.
HOUSEHOLD GOODS 121 LB.
INDUSTRIAL USES, 81 LB.
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 4296-66 (2) ECONOMIC RESEARCH SERVICE

Figure 4

In 1958, about 81 percent of the yarn was woven into cloth, 10 percent went to knitting mills, and the remainder into carpet and tufting yarns, thread, and other uses (35). Three-fourths of the woven cloth was finished. Of this, 44 percent was bleached and white finished, 33 percent plain dyed, and 23 percent printed. Although the styling and finishing of a large proportion of cotton cloth is controlled by converters, a substantial proportion is finished by mills. In addition, some of the larger integrated mills make consumer products such as sheets, towels, and diapers.

In the midsixties, there were about 570 mills spinning cotton lint into yarn. 6/ In addition, some mills make all of their yarn from fibers other than cotton. Other firms consume raw cotton, waste, and linters for nontextile uses such as mattresses, padding, batting, and upholstery materials. Many weaving, knitting, tufting, and braiding plants buy all of their yarn from spinning mills, and thus are concerned primarily with yarn quality rather than cotton quality.

Slightly more than a fourth of the cotton textile mills (about 162 of the 570) are owned by 10 large corporations with from 11 to 35 mills each. About another third of the mills belong to corporations with from two to seven mills each, or are independently incorporated but are linked together into groups of two to six mills, generally owned by the same stockholders and having some of the same individuals as officers of the several corporations. In most cases, one person supervises the purchase of cotton for all the mills of such groups. The remaining firms, about two-fifths of the total, are single-mill operations which are independently owned, or belong to a corporation which owns only one mill and which engages in other textile activities or uses the products of the mill as raw material for other uses.

Some of the large mill groups employ cotton fiber technologists and have their own fiber testing laboratories (24, 66). These firms may buy direct from producers in areas that their tests indicate produce the most suitable cotton for their needs. Other mill groups buy from large-volume shipping firms, which may use fiber tests in addition to grade and staple length as criteria for sorting bales into even-running lots (7). In contrast, many small independent mills buy cotton primarily on the basis of staple length and grade and are not too concerned with fiber strength, fineness, and other properties.

Cotton yarns may be classified as either carded or combed, and for a variety of end uses such as knitting, weaving, braiding, or tufting yarns. Cotton cloth may be classified into roughly 50 categories, such as duck, shirting, shade cloth, print cloth, sheeting, corduroy, drill, and dress goods. Production of some mill groups may include as many as 20 of these products, while others specialize in only 1 product such as sheeting or print cloth.

Diversified mill firms may be less selective in their purchasing and more selective in their cotton usage than specialized firms. Firms making several products may buy a broad cross section of the cotton crop, and then assign each bale to the product for which it is best suited based on its fiber properties. Single-product mills must be highly selective in buying to avoid receiving cotton that is not suitable for their use. It is not practical for such mills to reject and resell appreciable quantities of cotton that does not meet their requirements.

The quantities and qualities of cotton, wool, and manmade fibers purchased depend generally on the demand of ultimate consumers and the relative prices of

6/ Compiled from data contained in Davison's Textile Blue Book, which is published annually by Davison Publishing Company, Ridgewood, N. J.

these fibers. Although some mills are very selective buyers, as a group they are quite competitive in buying raw material for manufacturing. Because of the large number of mill firms, there is also strong competition in their selling markets. Hence, successful mills must continually strive for efficient and quality production. They must keep these two factors in mind, as well as reflected consumer demand, in determining the combination of raw materials to use in their plants.

Mills must hold some inventory of cotton and other raw materials. They must also hold some inventory of cloth. However, an effort is made to hold only the quantity needed to satisfy "normal" demands of their customers, especially when a drop in cloth prices is anticipated, or there is considerable uncertainty with respect to the future price of cotton and other fibers. Mill managers, then, typically concentrate on economical production, and not on speculation. They must strive to maximize their margin--the difference between costs of raw material and prices received for cloth.

Spindles in place and hours operated are two good measures of textile mill activity. In the early fifties, there were about 23 million cotton system spindles in place (3). By the midsixties, the number had declined to about 19 million. Spindle hours operated averaged almost 2.2 billion per week in the early fifties, compared with approximately 2.4 billion in the midsixties.

During the early fifties, about 94 percent of the cotton system spindles were operated on 100-percent cotton. Fifteen years later, only about 80 percent were operating on cotton; and the remainder were run on other fibers.

Loom operating hours on cotton broadwoven goods is another indication of the activity of the cotton textile industry. For calendar year 1953, weaving looms operated an average of almost 117 hours per week on broadwoven goods. In comparison, looms operated an average of about 135 hours per week on cotton broadwoven in 1965.

Converters and Finishing Plants 7/

Converters are the major intermediary between producers of unfinished cloth (mills) and users of finished cloth (garment makers and industrial users). Their prime function is to buy gray cloth from the most favorable mill source, move it through finishing plants, and then sell the finished cloth to the highest bidder. Because the bulk of gray cloth goes through them, these firms hold a key position in textile marketing. Even with the best of knowledge, they must outguess the market if their operations are to be profitable. Their profit is a residual--the difference between the initial costs of gray goods plus the costs of finishing and the selling price received for finished cloth.

Finishing plants, as a rule, do not take title to the cloth they process. Their major function is to finish cloth to order for converters. Finishing includes bleaching, dyeing, printing, mercerizing, and similar processes that put the cloth into the condition desired by converters, manufacturers of apparel, and final consumers. Specialized finishing plants have no spindles or looms but do have heavy investments in other types of machinery and equipment.

Although they do not own cloth, finishers are affected by fluctuations in textile prices. During declining prices, converters put pressure on finishers to lower their

7/ Most of this section and those that follow pertaining to manufacturing and distributing textiles were condensed from Miernyk and Zymelman (46).

margins, and sometimes to store cloth until shipment. Thus charges for finishing may drop below costs, primarily because of high overhead costs associated with large capital investment.

Another major function of converters, in addition to determining and ordering the finishing processes for their cloth, is holding title to the cloth. Regardless of the location of cloth inventories--at the mill, finishing plant, or elsewhere--it is the ownership of the cloth that places the converter in a key role in the textile industry.

Also, however, it places converters in a vulnerable market position. During the upswing of the textile cycle, the mill's bargaining position becomes stronger. An increase in new orders placed by converters increases the prices they must pay mills for cloth; to meet the demands of cutters and other customers, converters may be forced to book orders with mills several months in advance. If prices continue to rise, converters may realize a gain from this advance buying from mills; if prices break, however, converters may be forced to sell their cloth at less than cost.

During the downward phase of the textile cycle, inventories of cloth accumulate at the mill; this weakens mill management's bargaining power while strengthening that of converters. Although speculation is not their primary function, converters cannot avoid being speculators. Even though they stand to realize large windfall profits under some market conditions, they also bear the risks inherent in a volatile, price-competitive market.

Converters are also put in a vulnerable market position by the customary contractual arrangements they make with mills in buying cloth, and with cutters in selling cloth. Typically, cutters are able to cancel purchases from converters when they have overestimated their needs; chances for collecting through lawsuits are not good, and if they were, converters fear the loss of the cutters' goodwill. In contrast, contracts between mills and converters are regularly enforced. If a converter places an order for gray cloth, he is bound to accept delivery even if he has to resell at a loss. A large proportion of the more than 1,000 converters in the United States are located in a one-half-square-mile area in downtown New York City. Thus, because of the number of firms and their close proximity, converters' functions are performed under a high degree of competitiveness. Through styling, converters may differentiate their products; however, because of rapid changes in style and the ease of copying newly created styles, there is no longtime advantage of stylistic innovations.

Garment manufacturers, known as cutters in the textile trade, are the largest purchasers of finished cloth from converters. However, some finished cloth in the form of piece goods moves directly from converters to retail outlets. Converters also sell sizable quantities of finished cloth to industrial users other than apparel manufacturers.

Although their role is less important now than in the past, two other groups of firms, brokers and factors, may be involved in some cloth transactions. These firms have nothing to do with manufacturing textiles, nor do they buy and sell cloth for their own account. Acting as agents, their major function is to bring buyer and seller together. Their commission for this service varies according to the type of cloth involved.

Cutters and Industrial Users

The major function of cutters is buying finished cloth from converters and

mills, manufacturing the cloth into apparel items such as shirts and dresses, and selling these items to retailers. Hence, the cutter's demand for finished cloth is a derived demand dependent on that for the products he manufactures. In turn, the cutter's demand for cloth is reflected back to the textile mill through converters' orders for unfinished cloth.

Many firms in the garment industry are small, employing fewer than 50 people and requiring a small capital investment relative to the capital required by textile mills and finishing plants. Hence, entry into the industry is easy. As a result, it is a highly competitive industry, and there is a high turnover of establishments in apparel manufacturing.

As in other highly competitive industries, profit margins in apparel manufacturing are low compared to those of many other industries. Success in this industry depends on management's ability to anticipate changes and trends in fashions, to create and promote the demand for new styles, and to copy expensive fashions at relatively low prices.

The garment manufacturer's decision on the quantity of cloth to purchase from converters during a season is based in part on orders already received, and on prospects for additional orders. If the latter is overestimated, the manufacturer will have to sacrifice his output at prices that are below cost. Department stores with "bargain basements" are always alert for special purchases of this type.

Approximately 18 percent of the cotton consumed by U.S. mills eventually goes to various kinds of industrial end uses. Although substantial quantities of cotton are used by industry, the proportion has declined in recent years because of growing competition from paper, plastics, and other raw materials. Because of the many different industrial uses of textiles, factors affecting industrial demand are considerably different from those affecting the demand of the apparel industry. It is quite possible that a rise in industrial demand may cushion a drop in sales to cutters, or a decline in industrial sales may tend to offset an increase in sales to the garment industry. At other times, changes in both industrial and apparel demands may coincide, resulting in either a favorable or an adverse effect on the total demand for textiles.

Wholesaling Textile Products

Textile products are wholesaled by merchant wholesalers, manufacturers' sales branches and offices, and merchandise agents and brokers. Merchant wholesalers take title to the merchandise, buying from manufacturers and reselling principally to retail outlets. They may extend credit to customers, make deliveries, and serve as a source of market information for retailers. Manufacturers' sales branches and offices are usually separate establishments owned and maintained by manufacturers primarily for selling their products. Merchandise agents and brokers are independent firms that buy and sell for others rather than buying for their own account.

Wholesalers are a ready market outlet for many manufacturers of apparel and household items. The large-lot purchases of wholesalers and the assembly services wholesalers perform over long distances make possible a reduction in distribution cost. In addition, wholesalers reduce storage costs and credit risks of manufacturers by advance buying, and sometimes advance funds to manufacturers to aid their financing. They also relieve manufacturers of some financial risks in dealing with retailers, whose rate of failure is relatively high.

Wholesalers also perform important services for retailers. Because of the assembly function performed by wholesalers, most retailers can obtain their merchandise from only a few sources, thereby reducing buying costs. The readily accessible supplies available through wholesalers also enable retailers to reduce their overhead costs by use of small stocks and rapid turnover. Further, the total cost of storing apparel products is less since storage in a wholesaler's warehouse is less expensive than on the high-rent shelves of retailers.

Retail Outlets

Retail stores and mail-order houses are the major market outlets for the apparel manufacturing industry. Department stores, clothing specialty shops, and chainstores are the major retail outlets, and they have increased in importance in recent years relative to small independent and general stores. In the last few years, however, many food, drug, and other types of stores have been stocking apparel items.

The larger chainstores buy almost all of their stock directly from garment manufacturers; smaller chains and some of the independents do most of their buying from wholesalers. Although the sources, buying practices, and inventory policies of different types of retail establishments differ, as a group these firms do not wish to be caught with excessive inventory. This is particularly true in regard to outerwear garments, since styles and fashions may drastically change from one season to the next. When caught with excessive stocks, retailers may have to resort to unprofitable price-cutting sales to unload their surpluses. In other instances, retailers may be caught short; then they ask for rapid delivery of garments. Such failures to correctly anticipate consumer demand can set off a chain reaction which is reflected back to the cutter, the converter, and eventually to to the textile mill. As a result, prices for garments, finished and unfinished cloth, and yarn may at times fluctuate violently.

DIVISION OF CONSUMER'S COTTON DOLLAR

The many processes and services rendered from the time producers deliver their seed cotton to gins until consumers purchase cotton apparel and household items in retail stores involve considerable cost. Manufacturing yarn and finished cloth at the mill, and manufacturing and distributing the final product account for more than four-fifths of the total retail cost of 25 representative articles of cotton clothing and house furnishings. Retailing alone accounts for approximately 33 percent of the consumer's dollar, wholesaling 8 percent, manufacturing the finished article 30 percent, and manufacturing and finishing cloth about 12 percent.

On an average, the farmer receives between 14 and 15 percent of the consumer's retail dollar for these representative articles of clothing and house furnishings, and between 3 and 4 percent goes to ginning, compressing, storing, transporting, and various merchandising agencies required to move raw cotton from production areas to textile mill centers.

The proportion of the consumer's dollar going to cotton farmers and to agencies performing the various marketing functions has remained fairly constant for the past three decades. However, during this period, the cost of cotton items to the consumer has more than doubled, and the farm value of cotton used in making them has increased approximately threefold. Expressed in terms of 1 pound of cotton, the average composite retail cost of the 25 cotton products ranged from about $0.90 to $1.00 from 1935 to 1941. Beginning with 1942, the average cost rose rapidly to a high of $2.24

in 1951. Since then, the average has fluctuated between this high and a low of $2.07 in 1955.

The average farm value of the cotton used in making these items ranged between 8 and 13 cents a pound from 1935 through 1941, and then increased to 41 cents a pound by 1951. Since 1953, it has fluctuated between 34 and 30 cents a pound.

The net result of these changes in average retail cost of cotton products and the farm value of cotton used in making them has been a widening of the farm-retail spread during the past 30 years. For the late thirties and the early forties, this spread approximated 80 cents. By 1948, the farm-retail spread had more than doubled, and reached a high of $1.88 in 1961 and again in 1965. This spread accounts for about 86 percent of the consumer's dollar. However, this share would be somewhat greater if allowance were made for the 6.5 cent per pound equalization payment made by the Government that began in April 1964, and which for the 1965-66 season was 5.75 cents.

The share of the consumer's dollar accounted for by the farm value of cotton varies widely among products. For business shirts, farmers received about 6 percent of the 1965 average retail price of $4.26. For sheets, they received 30 percent of the 1965 average retail price of $2.25.

Salaries and wages combined are the largest single cost item; they accounted for 44 percent of the consumer's 1947 cotton dollar, and 49 percent of the 1962 cotton dollar. Wage rates have continued to rise since 1962, and preliminary reports indicate that nonfarm labor accounted for at least half of the consumer's cotton dollar by the midsixties.

Textile manufacturers are attempting to offset rising costs of labor and other inputs by greater investments in modern machinery. Annual expenditures for textile machinery almost doubled from 1960 to 1965, increasing from about $530 million to slightly more than $1 billion. Higher profits probably have also greatly stimulated investments in textile machinery. Profits after taxes as a percentage of sales for the 10 years 1954-63 fluctuated closely around the average of 2.2 percent. However, by 1965, profits were about 3.7 percent of sales.

The division of the consumer's dollar spent for items made of cotton indicates the relative importance, from the viewpoint of costs, of increasing efficiency and reducing costs for the different services. For example, a reduction of about 4 percent in the portion going to wholesaling and retailing would reduce the farm-retail spread more than a reduction of 50 percent in the combined margins for ginning, baling, and merchandising raw cotton.

SUPPLY OF COTTON AND COMPETING FIBERS

Making decisions that might lead to more efficient marketing of cotton and cotton products has been complicated during the past 30 to 40 years by major shifts in supply, demands, and prices for U.S. cotton and competing products (20). Historical changes in interrelationships among these factors are good indicators of the economic health and of the major problems of the cotton and cotton textile industries, and hence provide a basis for predicting the future for U.S. cotton.

Supply of Cotton in United States

Since 1930, the total annual supply of raw cotton in the United States has ranged

from a low of about 14.4 million bales in 1947 to a high of 30 million bales in 1965 (fig. 5). 8/ Although characterized by sharp yearly fluctuations, the supply of U.S. cotton since World War II has shown a definite upward trend.

Over the years, production has been the major component of annual supply, followed by carryover and imports. Acreage harvested and yield per acre, the major determinants of production, experienced very pronounced trends during the past 100 years. From the end of the Civil War up to the midtwenties, acreage harvested climbed from about 8 million acres to an alltime high of almost 45 million acres. Following this 60-year rise, acreage in cotton dropped to about 17.0 million acres in 1945. After World War II, acreage continued to decline slowly, although it fluctuated between a high of about 27 million acres in the early fifties and a low of about 11 million in the midsixties.

Yield per acre remained fairly constant from about 1870 to the midthirties, averaging approximately 175 to 200 pounds of lint per acre. From the late thirties up to about 1950, yields increased gradually, and averaged about one-half bale per acre. However, during the past 10 to 15 years, technological achievements in production have brought about marked increases in yield, to an alltime U.S. high of more than 1 bale per acre. Improved varieties; increased use of fertilizers, insecticides, herbicides, and water; and other improved cultural practices have greatly contributed to the recent upturn in yield per acre.

Because yield per acre remained fairly steady up to about 1935, the trend in total production closely paralleled the changes in cotton acreage. From 1866 to 1926, total production of cotton in the United States increased from about 2.0 million to a record 18.0 million bales. From this alltime high, total production decreased to 8.3 million bales in 1946. However, this 20-year drop in production was not as consistent and pronounced as the decline in acreage, because of the rising trend in yields. In fact, an excellent example of the scientific accomplishments of U.S. agriculture since World War II is the slight upward trend in total cotton production on a steadily declining acreage. In 1965, about 15 million bales were produced on 13.6 million acres, compared with 14.9 million bales on 26.9 million acres in 1951.

In addition to cultural practices, other factors are associated with the upward trend in production since 1945. During the past two decades, cotton acreage and production have gradually moved westward to the higher yielding States of New Mexico, Arizona, and California. Yields of about 2 bales per acre in the West are double the average for the remainder of the Cotton Belt and have increased more rapidly. Up to the end of World War II, only about 5 percent of the total U.S. crop was grown in the West; by the late fifties and up to the present, this area accounted for roughly 20 percent of the total crop. In comparison, the proportion of the total crop grown in the Southeast declined from 30 percent in 1945 to about 15 percent by the midsixties.

Mechanization of production and harvesting, and larger and fewer production units, also have contributed to the present upward trend in yields and production. In 1947-48, only about 2 percent of the total crop was harvested with machines; by 1964-65, approximately 78 percent was mechanically harvested. Machine harvesting, as compared to hand harvesting, permits producers to gather their entire crop

8/ Data for 1965, and in some cases for 1964, were either forecasts or preliminary estimates and are subject to later adjustment. Some of the data on quantities of cotton are in units of 500-lb. bales, others are in running bales; this accounts for minor discrepancies in similar data on different charts.

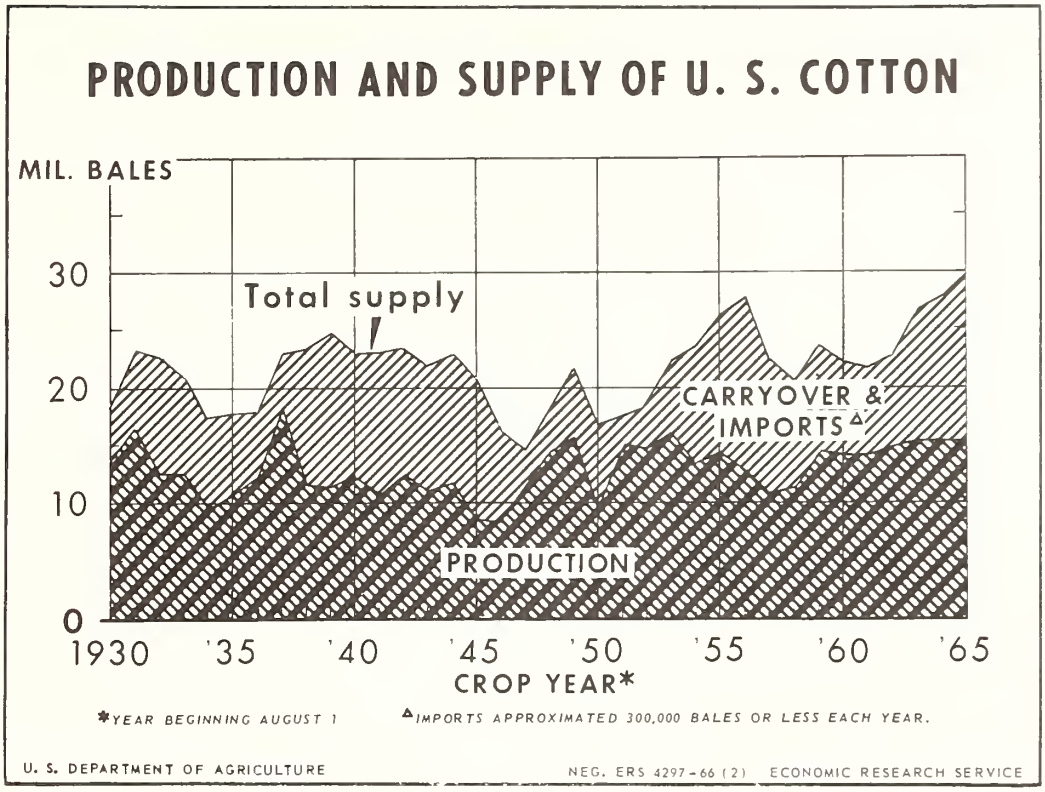


Figure 5

during optimum harvesting conditions in the fall and reduces field losses resulting from adverse winter weather.

In 1939, there were almost 1.6 million farms producing cotton in the United States. Twenty years later, the number of farms growing cotton had declined to 0.5 million. For the same period, the total number of farms in the Cotton Belt declined from 3.5 to 2.0 million.

Labor required to produce a bale of cotton has also been declining for many years. In 1930, 274 man-hours were needed to produce a bale; by the midsixties, less than 58 man-hours were needed. Within the same period, production per man-hour increased from 1.8 pounds to 8.6 pounds. This increased productivity resulted primarily from higher yields, larger farm units, and mechanization.

Since 1930, the quantity of cotton in the carryover, another major component of the U.S. annual supply of raw cotton, has ranged from a low of 2.3 million bales in 1951 to a high of 14.5 million bales in 1956, and has exceeded 10 million bales for 12 of the past 36 years. About 14.3 million bales were in the carryover at the beginning of the 1965-66 marketing year, and a new alltime high exceeding 16.5 million bales is estimated for August 1, 1966. For about half of the past 35 years, stocks held by the Commodity Credit Corporation have exceeded the stocks held by private establishments.

Cotton from other producing countries makes up only a very small portion of the annual U.S. supply. Imports have exceeded 300,000 bales a year only once since 1930, and have been less than 200,000 bales 27 of the past 33 years. In recent years,

a large proportion of U.S. imports of raw cotton have originated in the United Arab Republic, Egypt, India, Mexico, and Peru. In most years, considerably more than half of the volume imported has been long staple varieties, 1-3/8 inches and longer. U.S. cotton imports are limited by quotas; for 1965, the quota for all staples and types of cotton was 125,300 bales.

World Supply of Cotton

The world supply of cotton more than doubled during the last 3 decades, increasing from 37 million bales in 1930 to more than 70 million bales by the midsixties. From 1930 to 1937, world supply increased rapidly to about 50 million bales annually, then remained fairly stable at about 45 to 50 million bales up to 1950. Since then, it has risen sharply, and at a much steadier rate than the gradual increase in U.S. supply.

As in the United States, production is the major component of the world's yearly supply of cotton. From 1930 to 1946, world production fluctuated between a high of 37 million bales in 1937 and a low of 20 million bales in 1945. From this low, annual production steadily climbed to almost 50 million bales by the midsixties. The U.S. accounted for about 7 million bales of this increase, and foreign countries for 23 million.

Carryover is the other source of the annual supply of world cotton. Volume carried over was less than 20 million bales a year from 1947 through 1953. Since 1953, world carryover has approximated or exceeded 20 million bales.

Production and Supply of Competing Fibers

Wool, silk, and manmade fibers such as rayon, acetate, and noncellulosic fibers compete with cotton as raw materials for manufacturing textiles. In recent years, especially since World War II, competition from manmade fibers has greatly increased. For the world as a whole, production of rayons, acetates, and noncellulosics combined increased about eightfold from 1945 to 1964. In cotton equivalents, this 20-year increase was from 4 million to slightly more than 32 million bales (fig. 6). In 1945, world production of cotton was 5 times as large as world production of manmade fibers; by the midsixties, it was only about 1.5 times as large. Production of manmade fibers in the United States accounted for more than half of the world total in 1945; by the midsixties, U.S. production accounted for less than a third.

From 1940 to the early fifties, rayon and acetate accounted for a very large proportion of the U.S. output of manmade fibers. Since 1950, however, annual production of these two fibers combined has accounted for a steadily declining percentage. In terms of cotton equivalents, U.S. yearly production of rayon and acetate climbed steadily to about 4 million bales in the early fifties; since then production of these two fibers has leveled off at about 3 to 4 million bales. Production of noncellulosic fibers did not exceed 500,000 bales (in cotton equivalents) until 1950; after that time, annual production rapidly climbed to about 6 million bales in 1964.

Foreign countries, the early leaders in the manufacture of rayon and acetate, produced over 1 million bales (in cotton equivalents) in 1929. By the early forties their output totaled almost 6 million bales. Following a decline during World War II, foreign production of rayon and acetate climbed steadily to over 15 million bales

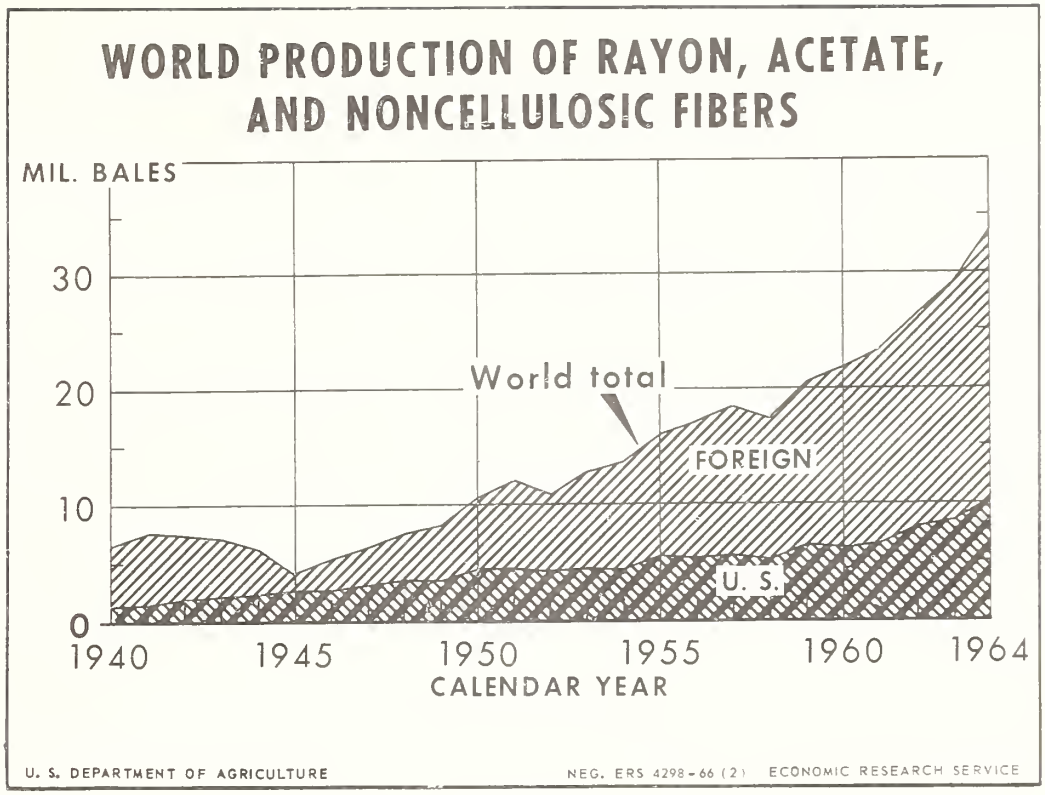


Figure 6

by the midsixties. Annual production of noncelluslosics in foreign countries followed a pattern similar to that in the United States. Quantity production began in the midforties, and reached the equivalent of 1 million bales of cotton by 1956; by the midsixties it amounted to about 8 million bales.

DISPOSITION OF COTTON AND COMPETING FIBERS

Market Outlets for U.S. Cotton

The total annual supply of U.S. cotton is sold to domestic mills, exported to foreign outlets, or is carried over to the following year. In more than half of the years since 1930, the quantity carried over at the end of the marketing year exceeded the quantity sold to domestic mills.

From the early thirties to the early forties, domestic mill consumption almost doubled, increasing from about 5 million bales in 1930 to about 11 million bales in 1941 and 1942 (fig. 7). From these 2 high years until the midfifties, domestic mill consumption approximated 9 to 10 million bales annually. During the past decade, U.S. mills have consumed roughly 8.0 to 9.5 million bales annually.

In the early thirties, U.S. exports of cotton exceeded domestic mill consumption. However, by the early forties, exports had dropped to approximately 1 to 2 million bales annually. Since the midforties, U.S. exports have fluctuated sharply between 2 and 7.5 million bales per year. Major U.S. export outlets are Western European countries, Canada, Japan, and India. At least four-fifths of U.S. exports of cotton

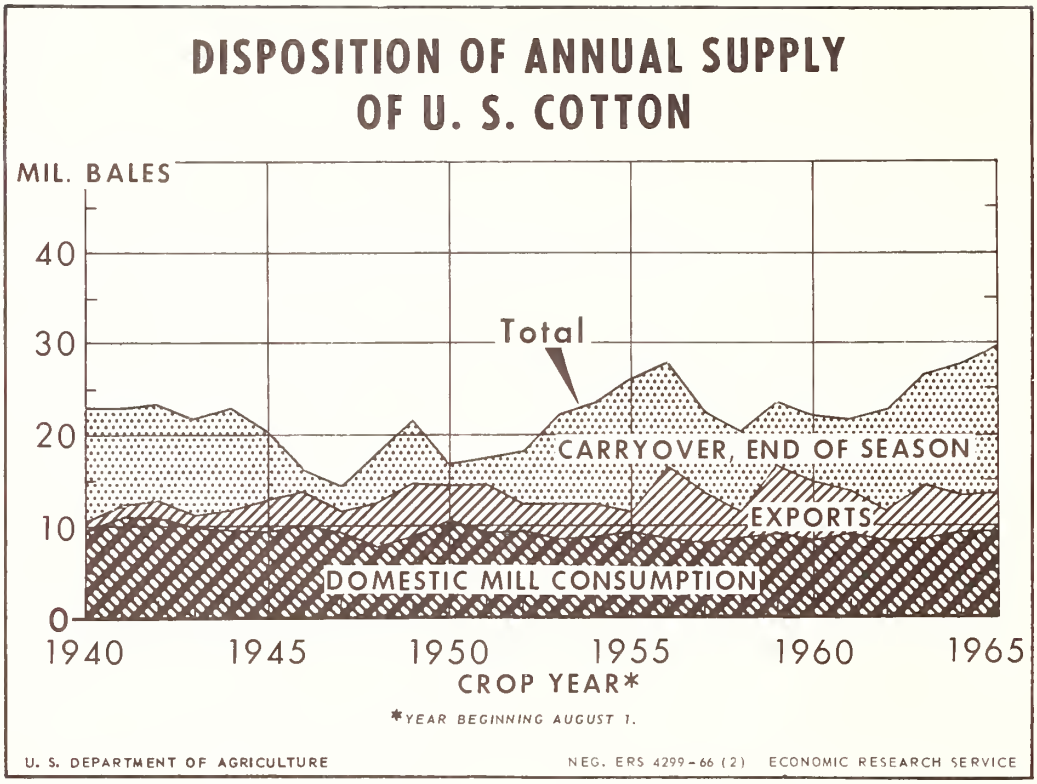


Figure 7

move through the ports of Galveston, New Orleans, Los Angeles, and San Francisco. These ports are listed in order of relative importance in terms of volume shipped. Most of the cotton shipped from West Coast ports goes to the Far East; a sizable quantity is shipped to Europe, however. In addition, many shipments from the Gulf Coast are destined for Far Eastern countries.

Total sales of U.S. cotton--mill consumption plus exports--have varied from about 11 to 16 million bales annually during the past 30 years, with a slight upward trend since World War II. However, total sales have not kept pace with expanded production in most years since the early fifties.

World Market for Cotton

The expansion in world consumption of cotton was temporarily halted during the economic depression of the late twenties and early thirties, and was set back for another 8 years by World War II. Since 1945, however, world consumption of cotton has more than doubled, increasing from 23 million bales to about 50 million bales. All of this growth, 27 million bales, has been in foreign countries.

The expanded world consumption of cotton has been accompanied by increased world exports. From 1944 to 1964, total world cotton exports increased from 5 million bales to about 17 million bales. Exports of foreign countries increased steadily from about 3 million to 13 million bales during the same period. U.S. annual exports varied from a low of 2 million to a high of 7.5 million bales, and averaged roughly 4 million bales, during the past 20 years.

Cotton's Competition for Markets

From the depression years of the thirties to the early years of World War II, U.S. consumption of all fibers increased from 3.1 billion to 6.9 billion pounds annually. Consumption declined slightly during the next few years to a low of 5.5 billion pounds in 1949. However, during the 1950's, annual U.S. consumption of all fibers ranged from about 6.0 to 7.0 billion pounds, and by the midsixties had reached 8.5 billion pounds.

Consumption of cotton closely followed the upward trend in consumption of all fibers from 1930 to 1942, increasing from 2.6 billion to 5.6 billion pounds annually. However, in contrast to the fairly stable consumption of all fibers combined since the years of World War II, U.S. consumption of cotton has slowly declined, falling to a level of about 4.0 billion pounds, or 8.5 million bales a year during the early sixties.

The trend in U.S. population since the thirties has been steadily and decidedly upward. From 1945 through 1965, U.S. population increased about 40 percent; in comparison, consumption of all fibers increased only about 14 percent, and consumption of cotton declined roughly 1 percent. Obviously, the per capita consumption of all fibers combined, and particularly of cotton, has been declining since World War II. For cotton, per capita consumption declined from about 32 to 23 pounds during the past two decades.

The ever-widening gap between consumption of cotton and consumption of all fibers is being filled primarily by manmade fibers. In 1930 cotton, wool, and manmade fibers accounted for 84, 9, and 4 percent, respectively, of the total fibers consumed in domestic mills (fig. 8). By the midsixties, cotton accounted for only about 53 percent of total fiber consumption, and manmade fibers for almost 43 percent.

In terms of total volume, consumption of rayon and acetate has ranged between 1.0 and 1.5 billion pounds annually since the midforties, while noncellulosics consumption increased from 0.1 to 1.6 billion pounds (fig. 9). Combined, the current volume of manmade fiber consumed is equivalent to about three-fourths of the volume of cotton consumed.

TRENDS IN PRICES AND PRICE RELATIONSHIPS

Farm Price and Value

From 1930 to 1940, the farm price of cotton varied between 5.5 and 12.5 cents per pound. Prices quadrupled from 1940 to 1950, increasing from about 10.0 cents to 40.0 cents per pound, the highest farm price since the mid-1800's. By 1952, the price had declined to less than 35.0 cents, and in succeeding years it has fluctuated between about 30 and 35 cents.

Farm prices were less than parity prices from 1930 through 1944, and from 1953 to the present. Farm prices exceeded parity prices from 1945 through 1952, except in 1949.

The trend in annual value of total farm production of cotton has followed the trend in prices received by farmers fairly closely since 1930. Farm value of the

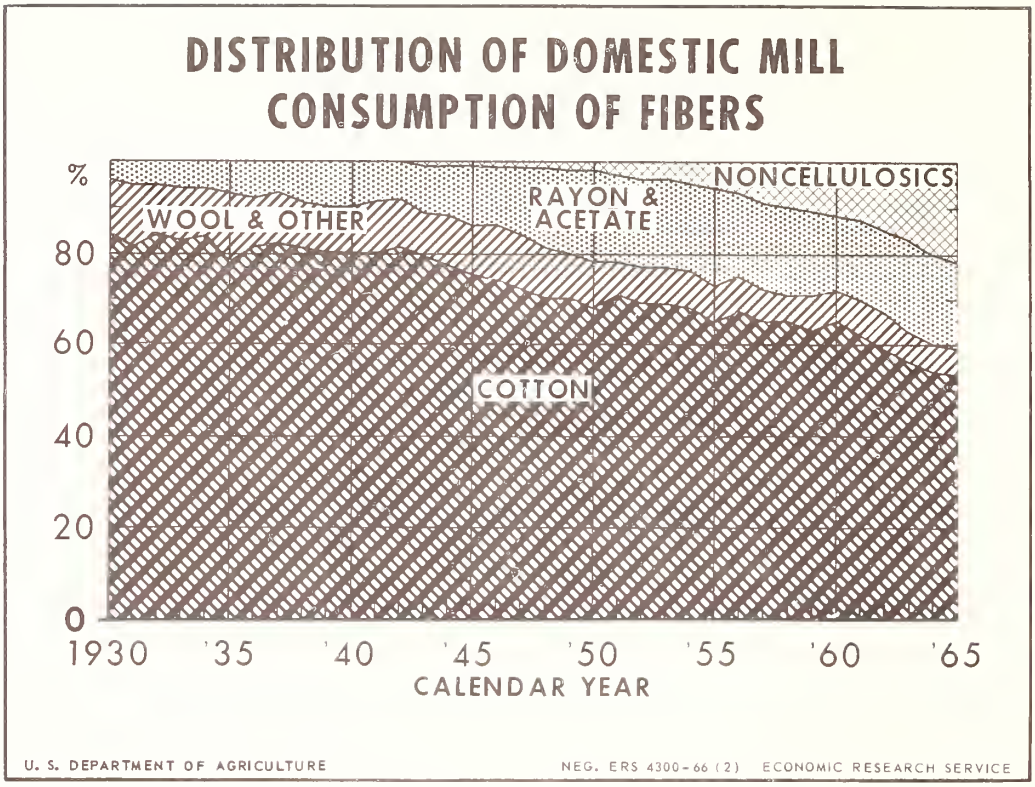


Figure 8

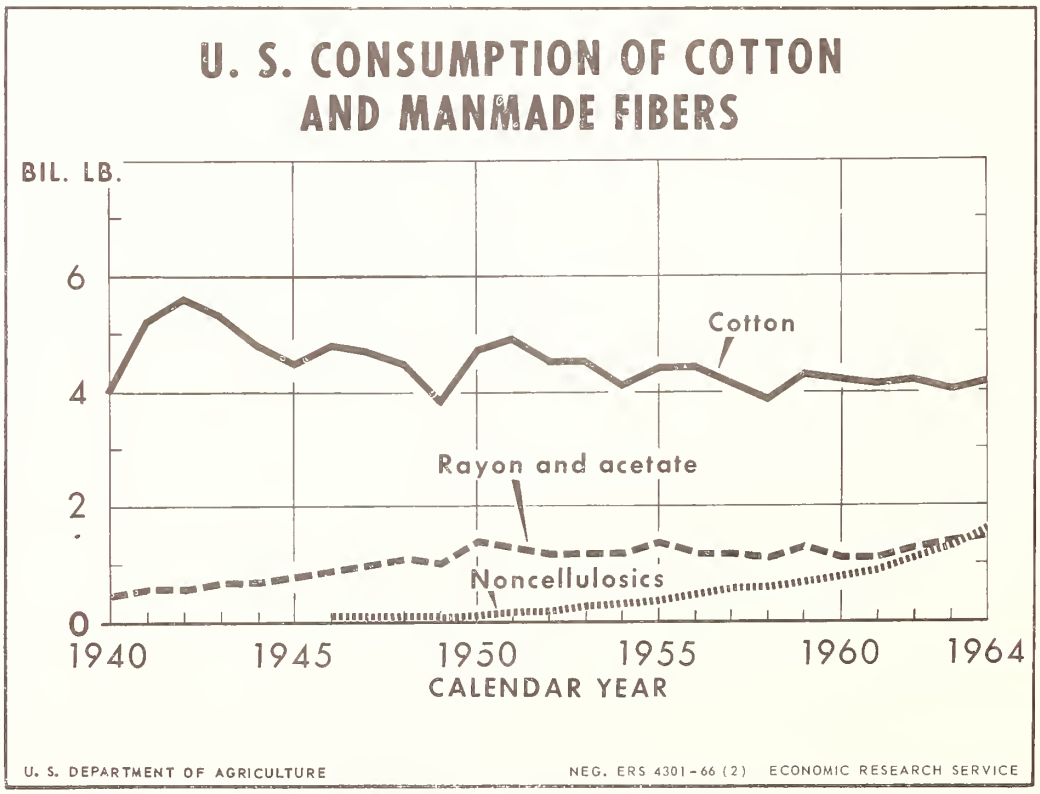


Figure 9

crop exceeded $2 billion for the first time in 1948, and reached almost $3 billion in 1951. For the 6 years 1959-64, the value ranged between $2.2 and $2.5 billion annually.

Central Market Prices

The trend and fluctuations in average price per pound for Middling 15/16-inch cotton at all designated spot cotton markets (see p. 137) reflect fairly closely the average price received by growers for all grades and staples. Except during the mid-1940's and again during the early fifties, the average designated spot market price for Middling 15/16-inch cotton closely approximated the loan rate for this grade and staple (fig. 10).

Prices for Middling 15/16-inch cotton landed at Group B mills ranged from less than 1.0 cent to about 2.5 cents above the average designated spot market price (fig. 11). From this difference in buying and selling prices, firms in the central market must derive their overhead and operating costs, and profits.

Mill Market Prices and Margins

Prices paid by mills for raw cotton closely approximate the quotations for the various grades and staple lengths landed at Group B mills. Based on average raw cotton costs (prices based on landed quotations at Group B mills for cottons produced in four different areas of the Cotton Belt) and unfinished cloth prices (converted to the approximate value of cloth obtainable from a pound of cotton), mill margins gyrated from less than 10 cents in the early thirties to almost 57 cents in 1947. Although they fluctuated, mill margins declined to the 20- to 30-cent level from the Korean War up to early 1964. Since then, mill margins widened to almost 39 cents in 1965. This increase is attributable to the equalization payment--which in effect reduces the cost of raw cotton to domestic users--and to rising prices for cotton cloth. 9/ Beginning with August 1964, monthly cloth prices increased steadily from an average of 60.83 cents per pound to an average of 65.43 cents per pound in August 1965.

Prices of Competing Fibers

In the early years of the manmade fiber industry, the price of rayon greatly exceeded the price of cotton. In 1930, the equivalent price per pound of usable fiber for rayon staple was about 5 times the price of Middling 15/16-inch cotton; by 1940, the price of rayon was still about double that of cotton (fig. 12). After another 5 years, prices for these two fibers were approximately the same, and beginning in 1945, the price of rayon has been below that of Middling 15/16-inch cotton. Prices for both have trended downward since 1950; however, the price of rayon is declining more rapidly than the price of cotton. In the early sixties, the rayon staple price was about three-fourths of the price of Middling 15/16-inch cotton. The increasing price advantage for rayon probably accounts for its relatively steady consumption compared with the gradual decline in cotton consumption since the early fifties.

9/ The equalization payment was 6.5 cents per pound from April 11, 1964, to July 31, 1965; beginning August 1965 it was 5.75 cents.

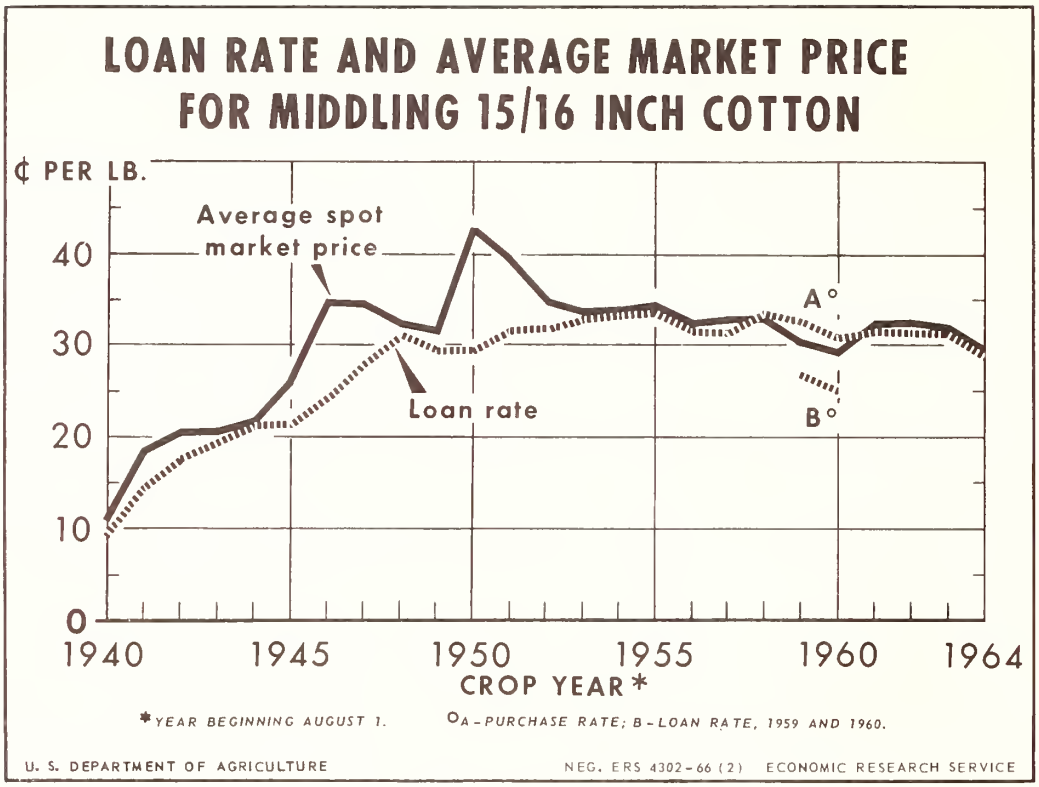


Figure 10

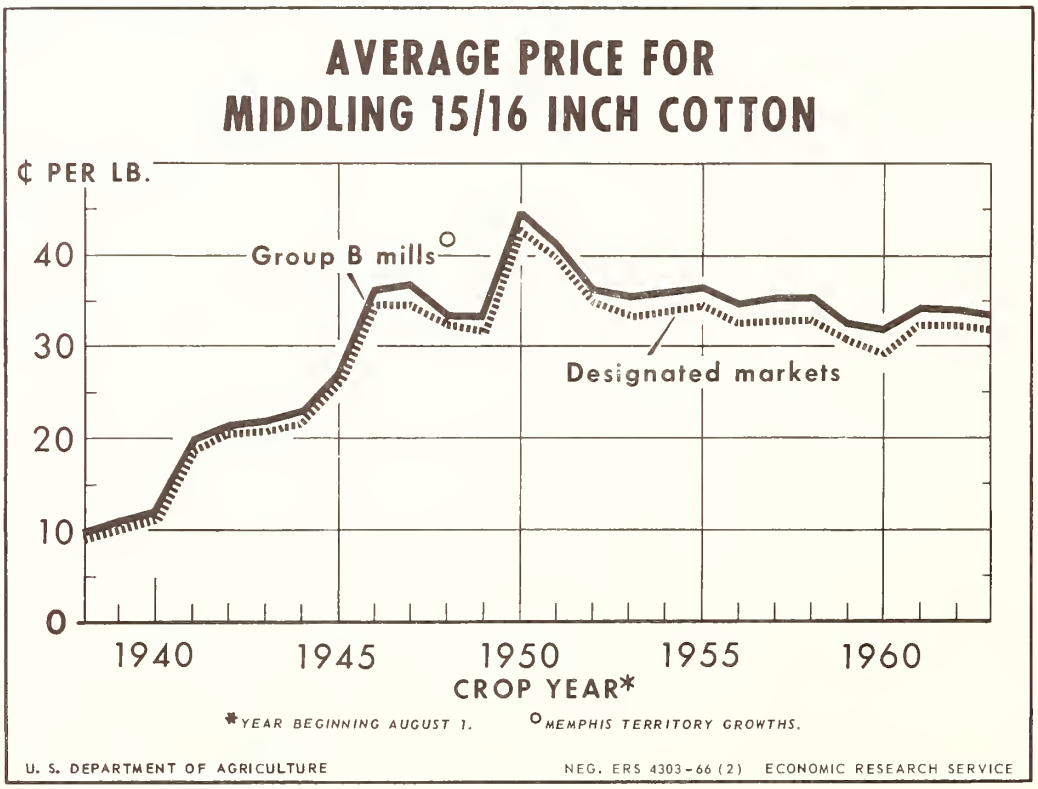


Figure 11

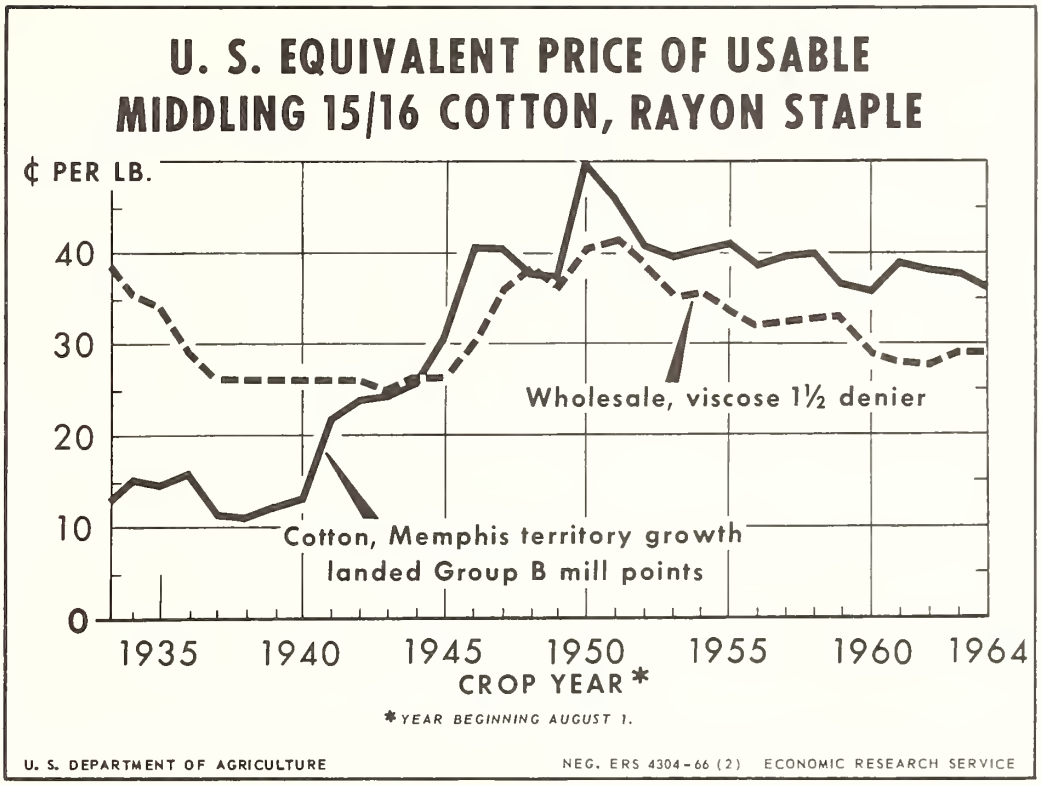


Figure 12

COTTON'S PROBLEMS AND PROSPECTS

The U.S. cotton industry has been confronted with a variety of problems during the past 30 to 35 years. These problems have ranged from low farm prices and incomes in the early thirties to the present loss of markets to manmade fibers and foreign cottons. It was generally conceded that prices for cotton were disastrously low during the early thirties; and, because of declining consumption and mounting surpluses, it is believed by many that prices in the early sixties are too high.

In addition to price, there are other facets to cotton's economic problems. However, prices and price legislation and their effects on industry have been a major concern of all segments of the cotton industry for the past third of a century. There is apparently no general agreement as to the one basic cause of cotton problems. Similarly, there is lack of agreement as to the effects of both tried and proposed solutions on firms at all stages of the producing-marketing system. Universally satisfactory short-run solutions are probably impossible because of the varying extent and degree of their economic impact on different segments of the industry.

Numerous Federal programs have been enacted for the purpose of aiding the cotton industry. In retrospect, most legislation has been directed to solving immediate short-run problems of low prices and surpluses. Research can provide some guides as to the effects of alternative solutions for the trade and for society to consider in making their decision.

Although the most controversial problems of the U.S. cotton industry revolve around prices, there are other problems confronting the industry. Many of these

problems arose partly as the result of--or are closely associated with--short-term solutions to pricing problems; others came about primarily as a result of technological developments. The development, mass production, and aggressive promotion of manmade fibers, the increase in mechanical harvesting and accompanying problems in ginning, the effects of various changes in processing and marketing practices on quality and end-use value, and similar problems are of equal concern to all segments of the industry. Solutions that are generally acceptable to all segments of the trade are needed if U.S. cotton is to maintain, let alone improve, its current status in the world fiber market.

Loss of Markets

Declines in cotton's proportionate share of the total U.S. fiber market, in the absolute quantity of cotton consumed, and in per capita consumption are ample evidence that cotton has lost domestic markets. In addition, the volatile fluctuations in exports reveal the lack of stability in foreign markets. Basically, loss of markets--regardless of the contributing causes--is the most crucial problem of the industry. All other problems are secondary, their solutions depending on the reversal or at least the checking of the downward trend in cotton sales.

If per capita mill consumption could be increased to the level existing in both the early fifties and the midthirties, the 196 million people in the United States today would consume about 11 million bales of cotton annually. This would approximate the alltime high in total consumption in 1941. Research to develop new markets for cotton is underway at the U.S. Department of Agriculture's utilization laboratory in New Orleans. New finishing processes, new uses, and other developments are under investigation. Whether the volume going to new market uses will offset cotton's losses in older established outlets is a challenge to the U.S. cotton industry. In one domestic end use alone--the tire cord and fabric market--the quantity of U.S. cotton used declined from about 600,000 bales in 1939 to 32,000 bales in 1963. For this period, cotton's share of total fibers used in this specific end use dropped from 96 to 2 percent. Cotton has lost this important industrial outlet to manmade fibers. Similar losses have occurred in some apparel and household outlets.

An analysis of the causes of U.S. cotton's loss of markets to manmade fibers and foreign-produced cottons is immensely complicated. Wartime shortages of natural fibers; competitive prices; rising costs of production, processing, and marketing; durability in various end uses; consumer acceptance and satisfaction--these and many other factors have all contributed. For a complete appraisal, the price and cost relationships of U.S. cotton to its most significant competitors in each end use should be analyzed.

U.S. cotton has lost export markets primarily to foreign-grown cotton and to manmade fibers. Production of manmade fibers was stimulated by the increased demand for fibers during World War II; it has been encouraged since then by a decline in prices relative to the prices for natural fibers.

The downward movement of rayon prices during the past decade, coupled with the slight decline in production, suggest that the U.S. market for rayon may be saturated, and that further inroads into traditional outlets for cotton may be negligible. However, the continued expansion of noncellulosic fibers remains a challenge to both U.S. and foreign-grown cottons.

Maintaining and Evaluating Cotton Quality

Twenty years ago, the quality of cotton was described by its grade, staple length, and "character." This was before the introduction of mechanical harvesting, and these measures of quality were generally satisfactory for merchandising purposes and for decisions relative to spinning operations. Within the last 10 to 15 years, as the proportion of the U.S. crop harvested mechanically has increased, mills have had increasing difficulties with cotton's spinnability, especially in plants with newer and faster machinery.

As indicated in a previous section, gins have installed additonal drying and cleaning equipment in order to clean up the rougher machine-harvested seed cottons so as to maintain high grades. These efforts have been generally successful, but in achieving this goal other components of quality have been adversely affected by defoliation for harvesting, and by excessive gin drying and cleaning in some areas.

Fiber length and length distribution, fiber fineness, strength and many other properties significantly affect mill operating costs and quality and value of the finished product. Considerable attention recently has been focused upon length uniformity in evaluating cotton quality and in predicting yarn quality.

By following pricing and loan policies that emphasize grade, both textile manufacturers and the Commodity Credit Corporation encourage ginning practices that improve grade, but at the same time may damage length and other inherent qualities of cotton. Improved means of evaluating cotton that will better reflect its end-use value and permit more effective pricing is urgently needed. In modern textile manufacturing, one of the first requisites is length and length distribution that has not been altered significantly from its basic nature. Any pricing structure used now or later must preserve these characteristics if cotton is to compete more effectively (54).

Packaging, Sampling, and Trading Improvements

As a result of sampling, compressing, and handling, U.S. cotton may arrive at U.S. and foreign mills in an unsightly condition, and the protection provided by the bagging may no longer be adequate (13, 14). These adverse effects and possible means for overcoming them have been known for several years (72). However, the problem is more prevalent and the need for correction more urgent today than ever before.

Mechanically drawn samples obtained during ginning are equal to cut samples for evaluating the initial quality of cotton (5, 8). In addition, mechanically drawn samples are more representative of the contents of a bale than cut samples, which are made up of only two portions taken from each side of the bale. Stored portions of mechanically drawn samples are also reliable up to about 6 months for subsequent merchandising purposes. Increased acceptance of this method of sampling would help improve the appearance of bales as they are moved to the mill, and would also reduce contamination of bale contents.

If all segments of the trade, including domestic mills and exporters, would adopt only one density for bales, warehouse compressing could be greatly reduced and possibly eliminated in some areas of the Cotton Belt. Gins could install presses which could economically produce bales of the desired dimensions and density (10). However, institutional factors, custom, and lack of acceptance must be overcome and changes in trading rules adopted before such improvements can be made.

Other changes in trading rules and practices would have to be adopted for the industry to realize the full benefits of mechanical sampling and one bale density. Net-weight trading and standards for tare appear to offer opportunities for more efficient pricing and marketing of cotton. The advantages, limitations, and necessary adjustments in trade rules associated with net-weight trading were summarized for the industry more than 25 years ago (71). However, cotton remains the only major agricultural commodity traded on a gross-weight basis.

Improvements in bale-covering materials and methods of wrapping are closely associated with net-weight trading, standards for tare, and general improvements in packaging, quality maintenance, and marketing efficiency. Lighter weight bagging and ties would reduce the total transportation costs of marketing cotton in both domestic and foreign outlets (13). More selective use of bale-covering materials and ties offers some possibilities for saving in packaging cost at the gin and preprocessing costs in the opening rooms of textile mills (38, 58).

Incorporating standardized moisture content into the trading rules may also contribute to more efficient marketing practices. However, the advantages and limitations of trading on the basis of standardized moisture content and its effects on costs and quality maintenance should be thoroughly evaluated before the practice is adopted.

Similarly, all of the improvements listed in the preceding paragraphs should be carefully appraised as to their combined contributions for reducing the cost of marketing cotton and maintaining its quality during storage and while in transit to domestic mills and foreign markets. It is generally agreed that production and marketing costs must be greatly reduced and quality improved or maintained, if cotton is to keep pace in the competitive textile market.

Effects of Public Control

For almost the last third of a century prices of U.S. cotton and some other farm products have been greatly influenced by legislation. For example, the availability of crop-support loans greatly reduces the risk of price fluctuations. Since the risks of price fluctuations have been almost completely eliminated, there is much less need for the "inventory insurance" provided by futures contracts. As a result, the New Orleans Cotton Exchange, after almost 100 years of business, suspended trading in 1964. The gross business of the New York Cotton Exchange dropped from over 325,000 contracts a year to less than 10,000 during the last decade.

For several years, the domestic price of cotton has exceeded the world price. Since 1956, exporters have been given a direct payment to offset the supported farm price. However, this action put U.S. cotton mills, which had to buy U.S. cotton at supported prices, at a competitive disadvantage with foreign textile manufacturers, who paid the lower world price even for U.S. cotton. Not only were U.S. mills having to pay a higher price than foreign mills for raw cotton from the same point of origin; the foreign mills were reselling the cotton in the United States in the form of finished products in competition with domestic mills.

On a raw-cotton-equivalent basis, imports of cotton textile products in the midsixties exceeded 600,000 bales annually. Ten years earlier imports of cotton textiles were equivalent to less than 100,000 bales.

During most of this 10-year period, there was an equalization payment on cotton products exports. However, in contrast to the six-fold increase in imports, U.S. exports of cotton textile products decreased from about 580,000 bales in the mid-fifties to less than 450,000 bales in the midsixties.

To correct this situation, and to increase the domestic consumption of cotton, the 1964 farm bill provided an equalization payment to domestic users of U.S. raw cotton. Although total domestic consumption was up slightly in 1964 and 1965, cotton's proportion of the total fiber market continued to decline; and prices for unfinished cloth rose, on an average, 4 to 5 cents per pound.

Meanwhile, the number of cotton farmers continues to decline, the average size of production units continues to get larger, and cotton in the carryover is approaching record levels. Per capita consumption of cotton in the United States in 1963 and 1964 was the lowest since the midthirties, whereas the per capita use of manmade fibers in 1964 was the highest on record.

It appears that competition from manmade fibers and foreign-grown cottons, changes in consumer demand, and public programs associated with these developments are adversely affecting the status of cotton in the national economy. The reduction in number of gins and active merchandising firms, and cotton's declning share of the U.S. fiber market are just a few examples of the problems confronting the U.S. cotton industry in the midsixties.

SUMMARY

From colonial days to the present, the production and marketing of cotton and the manufacture and distribution of cotton textiles have greatly contributed to the national economy. However, during the past several decades, manmade fibers have made substantial gains on cotton as textile raw materials. In addition, the U.S. cotton industry has been confronted with rising costs and increased competition from foreign cottons.

These developments have had a significant impact on the marketing systems for cotton and cotton textiles; on marketing costs and price spreads; and on production, consumption, and prices of cotton and competing textiles. An evaluation of these changes should help in appraising the effect of changes in marketing on the competitive position of U.S. cotton.

The physical processes of marketing raw cotton begin when producers deliver their harvested seed cotton to gins, where the lint is removed from the seed and packaged into bales weighing about 500 pounds. These bales are transported by truck to warehouses, where they are stored until sold and transported to domestic or foreign mills. Many warehouses are equipped with compresses, and a large proportion of the bales are reduced in size by compression in order to make more efficient use of storage and transportation facilities.

Ownership transfers between farm and mill begin when producers sell their cotton directly to firms located in the production areas. In some areas, producers market their cotton through cooperatives. The U.S. Government was an important outlet for producers during the early sixties.

Local market firms sell their purchases to central market firms and, in a few instances, direct to mills. Central market firms assemble raw cotton and deliver

it in the form and at the place and time desired by domestic and foreign mills. Through the competitive trading involved in performing these functions, prices for different qualities of cotton are established.

Major manufacturing processes required to convert raw cotton into consumer products involve textile mills, which spin yarn and weave cloth; finishing plants, which bleach, dye, and otherwise finish the cloth; and cutters, firms which make garments and household items. Ownership of semifinished and finished cotton textile products generally moves from mills to converters, cutters, wholesalers, and retailers.

Within the past 50 years, the number of gins declined from 25,000 to 5,000; the number of cotton warehouses declined to about 1,200 during the past 25 years, a 15-percent decline. However, the total volume handled has not changed appreciably since World War II. The number of central market firms has also declined during this period, primarily as a result of the rapid expansion of cooperatives and other forms of integration.

On an average, retailing accounts for about 33 percent of the consumer's cotton dollar; wholesaling, 8 percent; manufacturing yarn, cloth, and final products, 42 percent; and merchandising, warehousing, and ginning raw cotton, 3 percent. The farmer's share accounts for the remaining 14 percent.

The farmer's share of the consumer's cotton dollar varies widely among final products. The farmer receives about 6 percent of the average retail cost of a business shirt and 30 percent of the average retail price of sheets.

Labor is the largest cost item involved in marketing cotton and cotton products, accounting for about half of the consumer's retail dollar in the early sixties. To offset increases in labor costs and because of the improved outlook for profits, textile manufacturers have recently been modernizing their plants. Annual investments in textile machinery increased from $530 million in 1960 to more than $1 billion in 1965.

During these years of change, particularly since World War II, annual U.S. production and consumption of cotton have remained fairly stable at about 12 to 15 million bales, and 8 to 10 million bales, respectively. Exports fluctuated between 2 and 7.5 million bales a year, and carryover varied from 2 to 15 million bales. In contrast, world production of cotton increased from 20 million bales in 1945 to about 50 million in the midsixties, while world consumption increased from 23 million to about 50 million bales.

Manmade fibers have become a major textile raw material in the past 20 years, displacing millions of bales of cotton. World production of manmade fibers, in cotton equivalents, increased from 4 million bales in 1945 to more than 32 million bales in 1964, and U.S. production increased from about 2.5 million to more than 10 million bales annually. This loss of markets to manmade fibers is the most crucial problem of the U.S. cotton industry. Wartime shortages, competitive prices, rising costs of production and marketing, consumer acceptance of other fibers, and many other factors have contributed to cotton's loss of markets.

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